

Appl. No. 10/709,444
Andt. dated February 15, 2005
Reply to Office action of November 17, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

5 Listing of Claims:

- Claim 1 (original): A method for fabricating a bottle-shaped deep trench comprising:
 providing a substrate having a pad layer thereon;
 etching the pad layer and the substrate to form a deep trench, the deep trench having a
10 sidewall and a bottom surface;
 performing an atomic layer deposition (ALD) process to form a nonmetal layer on the
pad layer and on an upper portion of the sidewall of the deep trench; and
 performing an isotropic etching process by taking the nonmetal layer as a hard mask
to remove a portion of the sidewall and the bottom surface of the deep trench not covered
15 by the nonmetal layer so as to form a bottle-shaped deep trench.
- Claim 2 (original): The method of claim 1, wherein the ALD process is performed in a
low-pressure chemical vapor deposition (LPCVD) chamber.
- 20 Claim 3 (original): The method of claim 1, wherein the nonmetal layer is formed with a
plurality of ALD processes.
- Claim 4 (original): The method of claim 1, wherein the nonmetal layer is an ALD nitride
layer or an ALD oxide layer.
- 25 Claim 5 (original): The method of claim 1, wherein the isotropic etching process is a
wet-etching process.

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Claim 6 (original): The method of claim 5, wherein a wet-etching agent of the wet etching process is ammonia water (NH₄OH).

5 Claim 7 (new): The method of claim 1, wherein the method further comprises a step of removing the nonmetal layer after forming the bottle-shaped deep trench.

10 Claim 8 (new): The method of claim 1, wherein the nonmetal layer formed on the sidewall of the deep trench directly contacts the upper portion of the sidewall of the deep trench.